

In the CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

- 1 1. (currently amended) A method for maintaining cache coherency in a system
2 having a first controller and a second controller, comprising:
 - 3 selecting a mirror cache line in a second controller to copy data into;
 - 4 mirroring the data from a cache line in a first controller to the mirror cache line in the
5 second controller;
 - 6 sending a message from the first controller to the second controller informing the second
7 controller of cache meta data associated with data in the mirror cache line;
 - 8 sending a message from the first controller to the second controller requesting ownership
9 of a cache line owned by the second controller; and
 - 10 managing a free list of mirror locations in the second controller's cache by the first
11 controller, and managing a free list of mirror locations in the first controller's cache by the
12 second controller, wherein the first and second controllers can copy data into the second and first
13 controller's mirror locations, respectively; and
 - 14 granting ownership of a cache line owned by the second controller, to the first controller,
15 wherein, subsequent to the first controller receiving data that is to be mirrored to the second
16 controller cache line, transferring data to the second controller's cache line from the first
17 controller.
 - 1 2. (original) The method of claim 1, wherein the first controller has information
2 about the content of the second controller's cache, and the second controller has information
3 about the content of the first controller's cache.
 - 1 3. (previously presented) The method of claim 1, wherein the cache meta data
2 includes a logical unit number, a logical block number, a dirty bit map, and a cache identifier for
3 the data associated with the mirror cache line.
 - 1 4. (previously presented) The method of claim 1 further comprising placing the
2 address of the mirror cache line into a hash table of the first controller.

1 5. (previously presented) The method of claim 1 further comprising placing an
2 address of the mirror cache line into a write back queue of the first controller.

1 6. (canceled)

1 7. (canceled)

1 8. (canceled)

1 9. (previously presented) The method of claim 1, further comprising sending a
2 message to the second controller and providing the second controller with cache meta data
3 associated with the mirror cache line.

1 10. (original) The method of claim 1, further comprising switching ownership of
2 cache lines between the first controller and the second controller.

1 11. (original) The method of claim 1, further comprising, during failback,
2 transferring cache lines from a survivor controller that owns a substantial number of mirror cache
3 lines, to a replacement controller unit.

1 12. (original) The method of claim 1, further comprising, sending a message to a
2 controller of a mirror cache line, informing the controller that the associated cache line will be
3 flushed and the data associated with the mirror cache line will be temporarily invalid.

1 13. (previously presented) The method of claim 12, wherein sending the message to
2 the controller of the mirror cache line further comprises informing the controller that after the
3 associated cache line is flushed and the mirror cache line's data is consistent with a backing disk
4 and need not be written to the backing disk in the event of a failover.

1 14. (previously presented) The method of claim 1, further comprising indicating to
2 the first and second controllers that a cache line that has been flushed of data is available for
3 reuse.

1 15. (currently amended) A controller system for maintaining cache coherency,
2 comprising:

3 a disk array,
4 a first controller, coupled to the disk array, for selecting a mirror cache line on a second
5 controller; and
6 an interface for mirroring the data from a first controller cache line to the second
7 controller cache line;

8 wherein the first controller manages a free list of mirror locations in the second
9 controller's cache, and the second controller manages a free list of mirror locations in the first
10 controller's cache, the first and the second controller copying data into the second and the first
11 controller mirror locations, respectively; and

12 wherein a message is sent from the first controller to the second controller informing the
13 second controller about cache meta data associated with data in the mirror cache line, a message
14 is sent to the second controller, requesting ownership of a cache line owned by the second
15 controller, and the second controller sends a message granting ownership of a cache line owned
16 by the second controller, to the first controller, wherein, subsequent to the first controller
17 receiving data that is to be mirrored to the second controller cache line, transferring that data to
18 the second controller's cache line from the first controller.

1 16. (original) The controller system of claim 15 wherein the first controller has
2 information about the content of the second controller's cache, and the second controller has
3 information about the content of the first controller's cache.

1 17. (previously presented) The controller system of claim 15, wherein the cache meta
2 data includes a logical unit number, a logical block number, a dirty bit map, and a cache
3 identifier associated with the mirror cache line.

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1 18. (previously presented) The controller system of claim 15 further comprising the
2 first controller placing an address of the mirror cache line into a hash table of the first controller.

1 19. (previously presented) The controller system of claim 15 further comprising the
2 first controller placing an address of the mirror cache line into a write back queue of the first
3 controller.

1 20. (canceled)

1 21. (canceled)

1 22. (canceled)

1 23. (previously presented) The controller system of claim 15, further comprising the
2 first controller sending a message to the second controller informing the second controller of
3 cache meta data associated with data in the mirror cache line.

1 24. (original) The controller system of claim 15, wherein the first and second
2 controllers switch ownership of cache lines.

1 25. (original) The controller system of claim 15, further comprising, during failback,
2 a survivor controller that owns a substantial number of mirror cache lines transfers associated
3 cache lines to a replacement controller unit.

1 26. (original) The controller system of claim 15, wherein a message is sent to a
2 controller of a mirror cache line, informing the controller that the associated cache line will be
3 flushed and the data associated with the mirror cache line will be temporarily invalid.

1 27. (previously presented) The controller system of claim 26, wherein the message
2 that is sent to the controller of the mirror cache line further comprises informing the controller
3 that after the associated cache line is flushed, the mirror cache line's data is consistent with a
4 backing disk and need not be written to the backing disk in the event of a failover.

1 28. (previously presented) The controller system of claim 15, further comprising
2 indicating to the first and second controllers that a cache line that has been flushed of data is
3 available for reuse.

1 29. (Canceled)

1 30. (Canceled)